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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/687,825

10/20/2003

Koichi Tsuchiya

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EXAMINER

WEINSTEIN, LEONARD J

ART UNIT

PAPER NUMBER

3746

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,825

Applicant(s)

TSUCHIYA ET AL.

Examiner

Leonard J. Weinstein

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/10/2006.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 10/687,825, filed on 10/20/2003.

Drawings

2. Figure 2 is objected to under 37 CFR 1.83(a) because it fails to show article 49, a vent hole, as described in the specification and illustrated in Figure 1. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after

the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The disclosure is objected to because of the following informalities: lines 5-7 on page 10 state:

"Pumps 48A, 48B are functionally independent. The pumps are communicated with each other via communicating sections 47A, 47B and paths 45A, 45B."

Figure 2 shows that 48A and 48B "communicate" with paths 45A and 45B via openings (holes) 47A and 47B, and not with each other as stated.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 2, 3, and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine

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the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "communicates", in claims 1 and 5 of the claimed invention, is used by the claims to mean referenced components are inline with or within the path of one another. In claim 2 the term "communicates" is used to indicate that a component is emerged or at the very least touching another component. Finally in claim 3 the term "communicate" is used by the claim to indicate that a component opens up to another component. This objection is made based on the lack of consistency with the implied meaning of the term "communicates" in several instances where it is used to describe relationships between components of the claimed invention. Further the accepted meanings for the terms include "to transmit information" and alternatively "to join or connect." The term is indefinite because the specification does not clearly redefine the term.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodnight US Patent No. 6,457,561 (filed 5/25/2000), further in view of Khoo et al. US Patent No. 5,842,420 (filed 9/7/1993). With regards to claim 1, Goodnight '561 teaches a reciprocating compressor comprising a motor unit (Goodnight '561 – Line 48-55, column 1), a compressing unit disposed over said motor unit (Goodnight '561, Figure 2, article 60), and including a compressing room (Goodnight '561, Figure 2, article 62), a piston reciprocating in said compressing room (Goodnight '561, Figure 2, article 64), and a crankshaft for converting rotating action of said motor unit into reciprocating action of said piston (Goodnight '561, Figure 2, article 32); and an enclosed container for accommodating said motor unit and said compressing unit and for pooling lubricant oil (Goodnight '561, Figure 2, article 22). Further Goodnight '561 teaches a crankshaft including a centrifugal pump disposed at a lower section of said crankshaft and being open into the lubricant oil pooled in said container (Goodnight '561, Figure 2, articles 26), and a pair of spiral pumps, functionally independent, disposed at a middle section of said crankshaft, communicating with said centrifugal pump, and having leading grooves running in an opposite direction to each other (Goodnight '561, Figure 8, articles 42 and 44).

Goodnight does not teach a pair of vertical holes, functionally independent and prepared at an upper section of said crankshaft, open into said container and communicating with said spiral pumps respectively. Khoo et al. '420, with article 68 in Figure 5, does teach a single helical groove (spiral pump) that communicates with a

centrifugal pump (Khoo et al., Figure 5, article 64) disposed in the lower section of a crankshaft, and a vertical hole (Khoo et al., Figure 5, article 72) that is prepared at the upper section of a crankshaft (Khoo et al., Figure 5, article 75) and open to a container (Khoo et al., Figure 1, article 12). This method of lubricating a crankshaft within a compressor is well known within the art. Khoo et al. '420 as applied to Goodnight '561 would provide for each helical groove (Goodnight '561, Figure 8, articles 42 and 44) to be in communication with a functionally independent vertical hole. The motivation for combining the claimed inventions of Goodnight '561 and Khoo et al. '420 would be to ensure that the bearings, in contact with said crankshaft, are always properly and efficiently lubricated by facilitating a constant flow of oil from said reservoir to said bearings, regardless of the rotational direction of an active motor. Therefore it would have been obvious, to one of ordinary skill in the art, to combine Goodnight '561 and Khoo et al. '420, as applied above, to provide a lubrication system for a crankshaft that would perform (lubricate) the same, regardless of which direction the motor, of said compressor, was rotating.

8. With regards to claim 2, as applied to claim 1 of the claimed invention, Goodnight '561 does teach a centrifugal pump comprised of a throttle section that communicates with the lubricant oil pooled in said container (Goodnight '561, Figure 2, articles 26, 66, and 68), and a hollow cylinder extending upward from a lower end of said crankshaft (Goodnight '561, Figure 2, articles 32). Khoo et al. '420 does teach the limitation of the lower end of said crankshaft having an axis slanting toward the outer wall of said

crankshaft (Khoo et al., Figure 5, article 30) at an angle of theta (Khoo et al., Figure 5), which Goodnight '561 does not teach. As is stated in Khoo et al. '420, in lines 2-15 of column 4, the rate of oil that is drawn into the centrifugal pump (Khoo et al. '420, Figure 5, article 64) and therefore the total volume drawn is increased, from that of a centrifugal pump that is not disposed at a critical angle within the range of theta as shown in Figure 6 of Khoo et al. '420. Therefore it would have been obvious, to one of ordinary skill in the art, to combine Goodnight '561 and Khoo et al. '420, as applied above, to increase the rate and amount of oil that the centrifugal pump brought in and dispersed.

9. With regards to claim 3, as applied to claim 1 of the claimed invention, Goodnight '561 does not teach a vent hole communicating with said container being provided at an upper section of said centrifugal pump. Khoo et al. '420 does teach a vent hole communicating with the container of said compressor (Khoo et al. '420, Figure 5, article 76) that is displaced at the lower section of said crankshaft. This hole acts a vent to reduce the amount of air within the oil consumed by the centrifugal pump and is analogous to vent hole of the claimed invention. Therefore it would have been obvious, to one of ordinary skill in the art, to combine Goodnight '561 and Khoo et al. '420, as applied above, in order to provide a centrifugal pump, within the crankshaft of a compressor, capable of venting unwanted quantities of air from oil consumed by said centrifugal pump.

10. With regards to claim 4, Goodnight '561 does teach a reciprocating compressor, wherein said crankshaft further includes an eccentric shaft, a sub-shaft section and a main-shaft section which sandwich vertically the eccentric shaft, wherein said compressing unit includes a sub-bearing and a main-bearing, both of which are formed to cross with an axis of said compressing room at substantial right angles, for supporting said sub-shaft section and said main-shaft section respectively, and a linking section that links said piston to said eccentric shaft (Goodnight '561, Figure 5 and 8 – provided on the following pages). However claim 4 as applied to claim 1 is not satisfied. Goodnight '561 combined with Khoo et al. '420, as applied to claim 1 of the claimed invention as stated in paragraph 6, does teach all the limitations of claim 4 as it applies to claim 1 therefore it would have been obvious, to one of ordinary skill in the art, to combine the two.

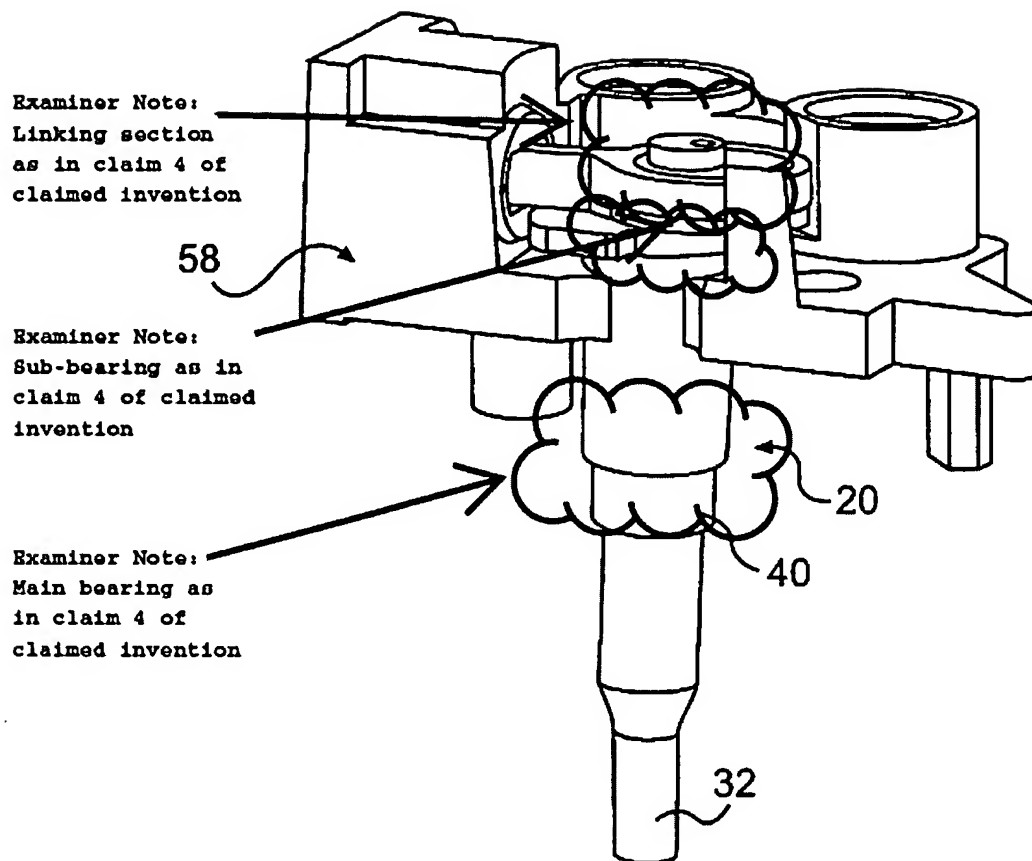
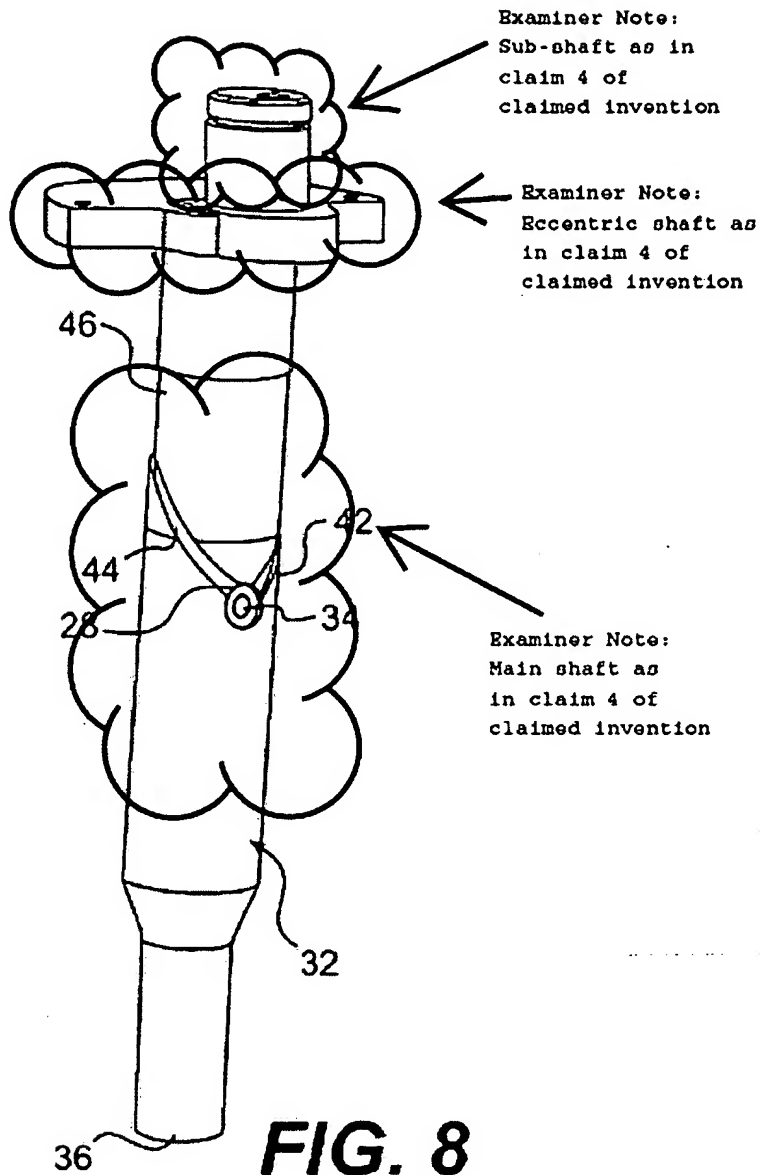


FIG. 5



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11. With regards to claims 6 and 7, as applied to claim 1 of the claimed invention, it is well known within the art to use a plurality of electric motors for use as the motor component of a reciprocating compressor. Goodnight '561 combined with Khoo et al. '420 does nothing to change this well known practice and therefore it would have been obvious, to one of ordinary skill in the art, to provide a three-phase induction motor or a single-phase resistant-start induction motor.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goodnight '561 and Khoo et al. '420, as applied to claims 1-4, and 6-7 above, and further in view of Andrione et al. US Patent No. 4,478,559 (filed 6/9/1981). Goodnight '561 and of Khoo et al. '420, as applied to claims 1-4, and 6-7 above does not teach a pair of helical grooves, functionally independent, prepared on an outer wall of said sub-bearing, and said helical grooves include leading grooves running in an opposite direction to each other and communicating with a pair of vertical holes respectively. Claim 1 of Andrione et al. '559 teaches the following:

"the improvement comprising a groove in the upper end face of the shaft extending from the outlet of the eccentric duct section to the lateral peripheral surface of the upper end portion of the shaft in an area where the outlet and the surface are closest together, said groove having a bottom which is inclined upwardly toward the lateral, peripheral surface and leading and trailing sides relative to the direction of rotation of the shaft wherein said trailing side of said groove is substantially tangential to the outlet of said duct and intersects a common diametral plane which includes the axis of rotation of the shaft and the axis of the eccentric duct section at the lateral peripheral surface of the upper end portion of the shaft at an acute angle which is pointed in the direction of rotation"

Goodnight '561 and Khoo et al. '420, as applied to claims 1-4, and 6-7, and further applied to Andrione et al. '559 would provide two vertical holes open to container of said compressor displaced on the top said crankshaft, also known as a sub-shaft

(Andrione et al. '559, Figure 1, article 68 of article 66) in the claimed invention. The groove of Andrione et al. '559 (Andrione et al. '559, Figure 2, article 72) could have a helical shape and still intersect common diametral planes. Applying Andrione et al. '559 in this manner would have been obvious since a helical groove can be made with a number of tools, as is well known in the art. Further the groove in Andrione et al. '559, article 72, will aid in maintaining the lubrication required by the sub-bearing (Andrione et al. '559, Figure 1, article 48), as in the claimed invention, for the compressor to work properly and avoid wear on its components. Further Andrione et al. '559 as applied above and combined with Goodnight '561 and of Khoo et al. '420, as applied to claims 1-4, and 6-7 as stated in paragraph 6, would lubricate the relevant components of the compressor, if the motor was rotated in either direction, by providing two functionally independent holes within said sub-shaft that communicate with two functionally independent grooves running in opposite directions from each other on the surface of said sub-shaft. Therefore, it would have been obvious, to one of ordinary skill in the art, to combine Andrione et al. '559 with Goodnight '561 and of Khoo et al. '420, as applied to claims 1-4, and 6-7 as stated in paragraph 6 above.


Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and are cited on form 892 herewith.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard J. Weinstein whose telephone number is 571-272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Stashick can be reached on 571-272-4561. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


LW
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PRIMARY EXAMINER